

# Claims

- [c1] 1.A method for adjusting powers of laser beams emitted by a pickup head of an optical disk drive, the pickup head comprising:
- a laser generator for generating laser beams projected onto a disk placed on the optical disk drive according to a cross-voltage, the powers of the laser beams generated by the laser generator varying with the cross-voltage;
  - a control end for receiving a control signal to adjust the cross-voltage such that the cross-voltage changes according to the control signal;
  - a reference signal end for receiving a bias voltage; and
  - a cross-voltage output end for outputting an output voltage, the output voltage corresponding to differences between the bias voltage and the cross-voltage; and
- the method comprising changing the control signal according to the differences between the bias voltage and the output voltage.
- [c2] 2.The method of claim 1, wherein the bias voltage is kept at a constant level and the step of changing the control signal according to the differences between the

bias voltage and the output voltage changes the control signal according to the output voltage.

[c3] 3.The method of claim 2 further comprising:  
filtering the output voltage with a low pass filter;  
wherein the step of changing the control signal according to the differences between the bias voltage and the output voltage changes the control signal according to the filtered output voltage.

[c4] 4.The method of claim 1, wherein the optical disk drive generates the control signal according to a first signal and a second signal, the second signal being changed according to the differences between the bias voltage and the output voltage when executing the step of changing the control signal according to the differences between the bias voltage and the output voltage, thus changing the differences between the first signal and second signal, the first signal indicating powers of laser beams for the optical disk drive during a recording process, and the second signal being generated along with the output voltage.

[c5] 5.The method of claim 4, wherein the optical disk drive further comprises:  
a digital to analog converter for transforming the second signal into an analog signal, the optical disk drive gener-

ating the control signal according to the differences between the first signal and the analog second signal when the optical disk drive generates the control signal according to the differences between the first signal and second signal.

[c6] 6.A controller for an optical disk drive, the controller being used to adjust powers of laser beams emitted by a pickup head of the optical disk drive, the pickup head comprising:

a laser generator for generating laser beams projected onto a disk placed on the optical disk drive according to a cross-voltage, the powers of the laser beams generated by the laser generator varying with the cross-voltage;

a control end for receiving a control signal to adjust the cross-voltage such that the cross-voltage changes according to the control signal;

a reference signal end for receiving a bias voltage; and  
a cross-voltage output end for outputting an output voltage, the output voltage corresponding to differences between the bias voltage and the cross-voltage, and the controller capable of changing the control signal by determining the differences between the bias voltage and the output voltage.

- [c7] 7.The controller of claim 6, wherein the controller is capable of keeping the bias voltage at a constant level, and the controller changes the control signal according to the output voltage when the controller changes the control signal according to the differences between the bias voltage and the output voltage.
- [c8] 8.The controller of claim 7, wherein the optical disk drive further comprises a low pass filter for filtering the output voltage, and the controller changes the control signal according to the filtered output voltage when the controller changes the control signal according to the output voltage.
- [c9] 9.The controller of claim 6 generating the control signal according to differences between a first signal and a second signal, the second signal being changed according to the differences between the bias voltage and the output voltage when the controller changes the control signal according to the differences between the bias voltage and the output voltage, thus changing the differences between the first signal and second signal, the first signal indicating powers of laser beams for the optical disk drive during a recording process, and the second signal being generated along with the output voltage.
- [c10] 10.The controller of claim 9 further comprising a digital

to analog converter for transforming the second signal into an analog signal, the controller changing the second signal according to differences between the analog second signal and the first signal when the controller generates the control signal according to the differences between the first signal and second signal.

- [c11] 11. A method for adjusting powers of laser beams emitted by a pickup head of an optical disk drive, the pickup head comprising:
- a laser generator for generating laser beams projected onto a disk placed on the optical disk drive according to a cross-voltage, the powers of the laser beams generated by the laser generator varying with the cross-voltage; and
  - a control end for receiving a control signal to adjust the cross-voltage such that the cross-voltage changes according to levels of the control signal; and
- the method comprising updating the control signal according to the levels of the control signal.
- [c12] 12. The method of claim 11 further comprising raising the levels of the control signal, the step of updating the control signal according to levels of the control signal updating the control signal according to the raised-level control signal.

[c13] 13.The method of claim 11, wherein the optical disk drive generates the control signal according to differences between a first signal and a second signal, the second signal being changed according to the levels of the control signal when executing the step of updating the control signal according to levels of the control signal, thus changing the differences between the first signal and second signal, the first signal indicating powers of laser beams for the optical disk drive during a recording process, and the second signal being generated by feeding back the control signal.

[c14] 14.The method of claim 13, wherein the optical disk drive further comprises:  
a digital to analog converter for transforming the second signal into an analog signal, the optical disk drive generating the control signal according to the differences between the first signal and the analog second signal when the optical disk drive generates the control signal according to the differences between the first signal and second signal.

[c15] 15.A controller for an optical disk drive, the controller being used to adjust powers of laser beams emitted by a pickup head of the optical disk drive, the pickup head comprising:  
a laser generator for generating laser beams projected

onto a disk placed on the optical disk drive according to a cross-voltage, the powers of the laser beams generated by the laser generator varying with the cross-voltage; and

a control end for receiving a control signal to adjust the cross-voltage such that the cross-voltage changes according to levels of the control signal, the controller capable of updating the control signal by determining the levels of the control signal.

[c16] 16.The controller of claim 15 further comprising:  
an amplifier for amplifying the control signal, the controller updating the control signal according to the amplified control signal when the controller updates the control signal according to the levels of the control signal.

[c17] 17.The controller of claim 15 generating the control signal according to differences between a first signal and a second signal, the second signal being updated according to the levels of the control signal when the controller updates the control signal according to the levels of the control signal, thus changing the differences between the first signal and second signal.

[c18] 18.The controller of claim 17 further comprising:  
a digital to analog converter for transforming the second

signal into an analog signal, the optical disk drive generating the control signal according to the differences between the first signal and the analog second signal when the optical disk drive generates the control signal according to the differences between the first signal and second signal.

- [c19] 19.A method for adjusting powers of laser beams emitted by a pickup head of an electro-optical system, the method comprising:  
projecting a laser beam onto a disk according to a cross-voltage, a power of the laser beam varying with the cross-voltage;  
feeding back the cross-voltage for comparing with a target voltage to generate a difference value; and  
adjusting a level of the cross-voltage according to the difference value to change the powers of the laser beams emitted by the pickup head.
- [c20] 20.The method of claim 19, wherein the laser beam has a constant power.
- [c21] 21.The method of claim 19, wherein the difference value is used to change a level of a control signal, the control signal corresponding to the level of the cross-voltage, such that the level of the cross-voltage varies with the level of the control signal.



- [c22] 22.The method of claim 21 further comprising:  
filtering the cross-voltage to get rid of high frequency components in the cross-voltage; and  
changing the control signal according to the filtered cross-voltage.
- [c23] 23.The method of claim 21, wherein the cross-voltage equals to a difference between an output voltage and a reference voltage.
- [c24] 24.The method of claim 21, wherein a level of the reference voltage is constant.
- [c25] 25.The method of claim 19 further comprising:  
transforming the cross-voltage into an analog cross-voltage before the step of generating the difference value.
- [c26] 26.A method for adjusting powers of laser beams emitted by a pickup head of an electro-optical system, the method comprising:  
projecting a laser beam onto a disk according to a cross-voltage, a power of the laser beam varying with the cross-voltage;  
feeding back a control signal to control a level of the cross-voltage to compare with a target voltage to generate a difference value; and

adjusting a level of the cross-voltage according to the difference value to change the powers of the laser beams emitted by the pickup head.

- [c27] 27.The method of claim 26, wherein the powers of the laser beams are constant.
- [c28] 28.The method of claim 26, wherein the difference value is used to change a level of a control signal, the control signal corresponding to the level of the cross-voltage, such that the level of the cross-voltage varies with the level of the control signal.
- [c29] 29.The method of claim 28 further comprising:  
amplifying the level of the cross-voltage; and  
changing the control signal according to the amplified cross-voltage.
- [c30] 30.The method of claim 28, wherein the cross-voltage equals to a difference between an output voltage and a reference voltage.
- [c31] 31.The method of claim 30, wherein a level of the reference voltage is constant.
- [c32] 32.The method of claim 26 further comprising:  
transforming the control signal into a power of a corresponding laser beam before the step of generating the

difference value.

[c33] 33. The method of claim 32 further comprising:  
transforming the transformed power of the corresponding laser beam into an analog signal.